UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/089,109	03/26/2002	Manabu Suhara	220983USOPCT	9110

22850 7590 12/03/2003

OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C.
1940 DUKE STREET
ALEXANDRIA, VA 22314

EXAMINER	
CANTELMO, GREGG	

ART UNIT	PAPER NUMBER
1745	

DATE MAILED: 12/03/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

UNITED STATES PATENT AND TRADEMARK OFFICE

COMMISSIONER FOR PATENTS
UNITED STATES PATENT AND TRADEMARK OFFICE
P.O. BOX 1450
ALEXANDRIA, VA 22313-1450
www.uspto.gov

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

MAILED
DEC 03 2003
GROUP 1700

Paper No. 13

Application Number: 10/089,109
Filing Date: March 26, 2002
Appellant(s): SUHARA ET AL.

Mr. Harris A. Pitlick
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed October 1, 2003.

(1) Real Party in Interest

A statement identifying the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

A statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

(3) Status of Claims

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Invention

The summary of invention contained in the brief is correct.

(6) Issues

The appellant's statement of the issues in the brief is correct.

(7) Grouping of Claims

Appellant's brief includes a statement that the claims do not stand or fall together and provides reasons as set forth in 37 CFR 1.192(c)(7) and (c)(8).

(8) Claims Appealed

The copy of the appealed claims contained in the Appendix to the brief is correct.

(9) Prior Art of Record

5,709,969	YAMIHIRA	1-1998
5,147,738	TOYOGUCHI	9-1992
5,702,843	MITATE	12-1997
JP 10-001316-A	SAKAI CHEMICAL IND.	1-1998

CO. LTD.

(10) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

1. obvious over JP 10-001316 A (JP '316).

JP '316 discloses a lithium cobalt composite oxide for a lithium secondary cell (abstract), which is represented by the formula $LiCo_{1-x}M_xO_2$ wherein $0 < x < 0.25$ and M is Ti, Hf, Ta, Nb or Zr (see translation of claim 1 and paragraph [0013]). Since the prior art product has the same elemental and stoichiometric composition as that of the instant claims, there is a reasonable expectation that the composite oxide in JP '316 will have the same properties as recited in instant claim 1.

As discussed above, $0 < x < 0.25$ which encompasses the range of instant claim 2 (also see paragraph [0013]0. Since the prior art product has the same the same elemental and stoichiometric composition as that of the instant claims, there is a reasonable expectation that the composite oxide in JP '316 will have the same properties as recited in instant claim 2.

The composition is employed as an active material in a positive electrode for a lithium secondary cell (paragraph [0040] as applied to claim 7).

The mixture comprises the active material above, an electrically conductive material and a binder supported on a current collector. The stainless steel support is the current collector (paragraph [0067] as applied to claim 8).

The stainless steel support is the current collector (paragraph [0067] as applied to claim 9).

A lithium secondary cell employs a positive electrode containing the lithium-cobalt composite oxide for a lithium secondary cell as defined in claim 1 above (paragraph [0040] as applied to claim 10).

Wherein the electrolyte solvent is a propylene carbonate, a cyclic carbonic ester (paragraph [0067] as applied to claim 11).

JP '316 discloses a lithium cobalt composite oxide for a lithium secondary cell (abstract), which is represented by the formula $LiCo_{1-x}M_xO_2$ wherein $0 < x < 0.25$ and M is Ti, Hf, Ta, Nb or Zr (see translation of claim 1 and paragraph [0013]). Since the prior art product has the same elemental and stoichiometric composition as that of the instant claims, there is a reasonable expectation that the composite oxide in JP '316 will have the same properties as recited in instant claim 13.

As discussed above, $0 < x < 0.25$ which encompasses the range of instant claim 2 (also see paragraph [0013]0. Since the prior art product has the same the same elemental and stoichiometric composition as that of the instant claims, there is a reasonable expectation that the composite oxide in JP '316 will have the same properties as recited in instant claim 13.

With respect to the properties of the composition as recited in claims 1, 2 and 13:

Where Appellant claims a composition in terms of a function, property or characteristic and the composition of the prior art is the same as that of the claim but the function is not explicitly disclosed by the reference, the examiner may make a rejection under both 35 U.S.C. 102 and 103, expressed as a 102/103 rejection. "There

is nothing inconsistent in concurrent rejections for obviousness under 35 U.S.C. 103 and for anticipation under 35 U.S.C. 102." In re Best, 562 F.2d 1252, 1255 n.4, 195 USPQ 430, 433 n.4 (CCPA 1977). This same rationale should also apply to product, apparatus, and process claims claimed in terms of function, property or characteristic. Therefore, a 35 U.S.C. 102/103 rejection is appropriate for these types of claims as well as for composition claims.

"[T]he PTO can require an Appellant to prove that the prior art products do not necessarily or inherently possess the characteristics of his [or her] claimed product. Whether the rejection is based on inherency' under 35 U.S.C. 102, on prima facie obviousness' under 35 U.S.C. 103, jointly or alternatively, the burden of proof is the same...[footnote omitted]." The burden of proof is similar to that required with respect to product-by-process claims. In re Fitzgerald, 619 F.2d 67, 70, 205 USPQ 594, 596 (CCPA 1980) (quoting In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433-34 (CCPA 1977)).

Where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a prima facie case of either anticipation or obviousness has been established. In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977).

"Products of identical chemical composition can not have mutually exclusive properties." A chemical composition and its properties are inseparable. Therefore, if the prior art teaches the identical chemical structure, the properties Appellant discloses

and/or claims are necessarily present. In re Spada, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990). See MPEP § 2112.

With respect to the process limitations of claims 12 and 14:

Claims 12 and 14 are drawn to process limitations for fabrication of the product of claims 1 and 13, respectively. The various constituents therein have particular particle size and specific surface area and are fired at a temperature of 850 to 1,000° C in an oxygen-containing atmosphere for a period from 4-30 hours.

These intermediate constituents while having particular average particle size and specific surface area is not clearly and linearly applicable to the end product of claim 1. The product itself claims no particular particle size or specific surface area and the process steps of claims 12 and 14 manipulate the mixture of constituents of claim 5 to form the end product of claim 1. Thus while the intermediate constituents may have particular dimensions it is not held that these dimensions are linearly applicable to the end product.

Regarding the overall process of claims 12 and 14, the prior art fabricates the same product, as discussed above. The instant application has not established that the prior art product does not anticipate or obviate the product of claim 1. Since it is the Examiner's position, based on the prior art teachings above, that the prior art product anticipates or is obvious over the product of claim 1, and there is no evidence that the process of claims 12 and 14 are critical in obtaining the product of the instant claims,

the prior art is held to anticipate or render obvious the product by process limitations of claims 12 and 14.

"[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." In re Thorpe, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985) (citations omitted).

"The Patent Office bears a lesser burden of proof in making out a case of prima facie obviousness for product-by-process claims because of their peculiar nature" than when a product is claimed in the conventional fashion. In re Fessmann, 489 F.2d 742, 744, 180 USPQ 324, 326 (CCPA 1974). Once the Examiner provides a rationale tending to show that the claimed product appears to be the same or similar to that of the prior art, although produced by a different process, the burden shifts to Appellant to come forward with evidence establishing an unobvious difference between the claimed product and the prior art product. In re Marosi, 710 F.2d 798, 802, 218 USPQ 289, 292 (Fed. Cir. 1983). Ex parte Gray, 10 USPQ2d 1922 (Bd. Pat. App. & Inter. 1989).

"[T]he lack of physical description in a product-by-process claim makes determination of the patentability of the claim more difficult, since in spite of the fact that the claim may recite only process limitations, it is the patentability of the product claimed and not of the recited process steps which must be established. We are therefore of the opinion that when the prior art discloses a product which reasonably appears to be

either identical with or only slightly different than a product claimed in a product-by-process claim, a rejection based alternatively on either section 102 or section 103 of the statute is eminently fair and acceptable. As a practical matter, the Patent Office is not equipped to manufacture products by the myriad of processes put before it and then obtain prior art products and make physical comparisons therewith." In re Brown, 459 F.2d 531, 535, 173 USPQ 685, 688 (CCPA 1972).

See MPEP section 2113.

2. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over JP '316 in view of U.S. patent No. 5,709,969 (Yamihira).

The teachings of claim 1, with respect to JP '316, have been discussed above and are incorporated herein. The International Search Report PCT/ISA/210 and the International Preliminary Examination Report PCT/ISA/409 both appear to indicate that claim 4 lacks novelty, and would therefore appear to be anticipated by this reference. However there is no explicit disclosure of the packing density of this product and packing density can vary in a given composition due to the pressing of the mixture and therefore is not held to be taught by JP '316.

The difference between claim 4 and JP '316 is that JP '316 does not disclose of the positive electrode having a packing density from 2.90- 3.35 g/cm^3.

If the characteristics of the positive electrode are taken into account, the volumetric density of the sintered mass is preferably 2.0 to 4.3 g/ml. If the volumetric density is lower than this range, the energy density cannot be improved sufficiently. Conversely, if the volumetric density of the sintered mass surpasses this range, the

electrolyte solution is lowered in impregnating characteristics and in the charging/discharging characteristics. Thus it is preferred to set the pressure for compression molding so that the volumetric density of the sintered mass will be in a range of from 2.0 to 4.3 g/ml and desirably in a range of from 2.5 to 4.0 g/ml (paragraph bridging columns 3 and 4).

In an example LiCoO2 has a packing density of 3.1 g/ml (3.1 g/cm^3 col. 6, ll. 61-63). This specific example is a data point within the instant claim range. Furthermore the range of Yamihira 2.0-4.3 g/ml encompasses the range of 2.90-3.35 g/cm^3. In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists. In re Wertheim, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); In re Woodruff, 919, F.2d 1575, 16 USPQ 2d 1934 (Fed. Cir. 1990).

The motivation for providing a density within a range of 2.5 to 4.0 g/ml such as 3.1 g/ml is to optimize the energy density of the electrode, the electrolyte solution impregnation characteristics of the electrode and the charging and discharging characteristics of the electrode and cell.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of JP '316 by providing a packing density in the range of 2.90-3.35 g/cm^3 since it would have optimized the energy density of the electrode, the electrolyte solution impregnation characteristics of the electrode and the charging and discharging characteristics of the electrode and cell. Generally, differences in ranges will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such ranges is critical.

In re Boesche , 617 F.2d 272, 205 USPQ 215 (CCPA 1980). In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). In re Hoeschele, 406 F.2d 1403, 160 USPQ 809 (CCPA 1969).

3. Claims 1, 2, 7 and 10-14 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over U.S. patent No. 5,147,738 (Toyoguchi).

Toyoguchi discloses a hexagonal (col. 2, ll. 1-8) lithium cobalt composite oxide for a lithium secondary cell (abstract), which is represented by the formula $LiCo_{1-x}M_xO_2$ wherein x =0.02 and M is Ti (see Table 4 wherein Y=0.02 and x=1.0). Since the prior art product has the same lattice structure and the same elemental and stoichiometric composition as that of the instant claims, there is a reasonable expectation that the composite oxide in Table 4 will have the same properties as recited in claim 1.

As discussed above, x=0.02. Since the prior art product has the same lattice structure and the same elemental and stoichiometric composition as that of the instant claims, there is a reasonable expectation that the composite oxide in Table 4 will have the same properties as recited in claim 2.

The composition is employed as an active material in a positive electrode for a lithium secondary cell (abstract as applied to claim 7).

A lithium secondary cell employs a positive electrode containing the lithium-cobalt composite oxide for a lithium secondary cell as defined in claim 1 above (abstract as applied to claim 10).

Wherein the electrolyte solvent is a cyclic or chain carbonic ester (col. 3, ll. 11-15 as applied to claim 11).

Toyoguchi discloses a hexagonal (col. 2, ll. 1-8) lithium cobalt composite oxide for a lithium secondary cell (abstract), which is represented by the formula $LiCo_{1-x}M_xO_2$ wherein x =0.02 and M is Ti (see Table 4 wherein Y=0.02 and x=1.0). Since the prior art product has the same lattice structure and the same elemental and stoichiometric composition as that of the instant claims, there is a reasonable expectation that the composite oxide in Table 4 will have the same properties as recited in claim 13.

As discussed above, x=0.02. Since the prior art product has the same lattice structure and the same elemental and stoichiometric composition as that of the instant claims, there is a reasonable expectation that the composite oxide in Table 4 will have the same properties as recited in claim 13.

With respect to the properties of the composition as recited in claims 1, 2 and 13:

Where Appellant claims a composition in terms of a function, property or characteristic and the composition of the prior art is the same as that of the claim but the function is not explicitly disclosed by the reference, the examiner may make a rejection under both 35 U.S.C. 102 and 103, expressed as a 102/103 rejection. "There is nothing inconsistent in concurrent rejections for obviousness under 35 U.S.C. 103 and for anticipation under 35 U.S.C. 102." In re Best, 562 F.2d 1252, 1255 n.4, 195 USPQ 430, 433 n.4 (CCPA 1977). This same rationale should also apply to product, apparatus, and process claims claimed in terms of function, property or characteristic.

Therefore, a 35 U.S.C. 102/103 rejection is appropriate for these types of claims as well as for composition claims.

"[T]he PTO can require an Appellant to prove that the prior art products do not necessarily or inherently possess the characteristics of his [or her] claimed product. Whether the rejection is based on inherency' under 35 U.S.C. 102, on prima facie obviousness' under 35 U.S.C. 103, jointly or alternatively, the burden of proof is the same...[footnote omitted]." The burden of proof is similar to that required with respect to product-by-process claims. In re Fitzgerald, 619 F.2d 67, 70, 205 USPQ 594, 596 (CCPA 1980) (quoting In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433-34 (CCPA 1977)).

Where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a prima facie case of either anticipation or obviousness has been established. In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977).

"Products of identical chemical composition can not have mutually exclusive properties." A chemical composition and its properties are inseparable. Therefore, if the prior art teaches the identical chemical structure, the properties Appellant discloses and/or claims are necessarily present. In re Spada, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990). See MPEP § 2112.

With respect to the process limitations of claims 12 and 14:

Claims 12 and 14 are drawn to process limitations for fabrication of the product of claims 1 and 13, respectively. The various constituents therein have particular particle size and specific surface area and are fired at a temperature of 850 to 1,000° C in an oxygen-containing atmosphere for a period from 4-30 hours.

These intermediate constituents while having particular average particle size and specific surface area is not clearly and linearly applicable to the end product of claim 1. The product itself claims no particular particle size or specific surface area and the process steps of claims 12 and 14 manipulate the mixture of constituents of claim 5 to form the end product of claim 1. Thus while the intermediate constituents may have particular dimensions it is not held that these dimensions are linearly applicable to the end product.

Regarding the overall process of claims 12 and 14, the prior art fabricates the same product, as discussed above. The instant application has not established that the prior art product does not anticipate or obviate the product of claim 1. Since it is the Examiner's position, based on the prior art teachings above, that the prior art product anticipates or is obvious over the product of claim 1, and there is no evidence that the process of claims 12 and 14 are critical in obtaining the product of the instant claims, the prior art is held to anticipate or render obvious the product by process limitations of claims 12 and 14.

"[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-

process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." In re Thorpe, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985) (citations omitted).

"The Patent Office bears a lesser burden of proof in making out a case of prima facie obviousness for product-by-process claims because of their peculiar nature" than when a product is claimed in the conventional fashion. In re Fessmann, 489 F.2d 742, 744, 180 USPQ 324, 326 (CCPA 1974). Once the Examiner provides a rationale tending to show that the claimed product appears to be the same or similar to that of the prior art, although produced by a different process, the burden shifts to Appellant to come forward with evidence establishing an unobvious difference between the claimed product and the prior art product. In re Marosi, 710 F.2d 798, 802, 218 USPQ 289, 292 (Fed. Cir. 1983). Ex parte Gray, 10 USPQ2d 1922 (Bd. Pat. App. & Inter. 1989).

"[T]he lack of physical description in a product-by-process claim makes determination of the patentability of the claim more difficult, since in spite of the fact that the claim may recite only process limitations, it is the patentability of the product claimed and not of the recited process steps which must be established. We are therefore of the opinion that when the prior art discloses a product which reasonably appears to be either identical with or only slightly different than a product claimed in a product-by-process claim, a rejection based alternatively on either section 102 or section 103 of the statute is eminently fair and acceptable. As a practical matter, the Patent Office is not equipped to manufacture products by the myriad of processes put before it and then

obtain prior art products and make physical comparisons therewith." In re Brown, 459 F.2d 531, 535, 173 USPQ 685, 688 (CCPA 1972).

See MPEP section 2113.

4. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Toyoguchi in view of U.S. patent No. 5,709,969 (Yamihira).

The teachings of claim 1, with respect to Toyoguchi, have been discussed above and are incorporated herein.

The difference between claim 4 and Toyoguchi is that Toyoguchi does not disclose of the positive electrode having a packing density from 2.90- 3.35 g/cm^3.

If the characteristics of the positive electrode are taken into account, the volumetric density of the sintered mass is preferably 2.0 to 4.3 g/ml. If the volumetric density is lower than this range, the energy density cannot be improved sufficiently. Conversely, if the volumetric density of the sintered mass surpasses this range, the electrolyte solution is lowered in impregnating characteristics and in the charging/discharging characteristics. Thus it is preferred to set the pressure for compression molding so that the volumetric density of the sintered mass will be in a range of from 2.0 to 4.3 g/ml and desirably in a range of from 2.5 to 4.0 g/ml (paragraph bridging columns 3 and 4).

In an example LiCoO2 has a packing density of 3.1 g/ml (3.1 g/cm^3 col. 6, ll. 61-63). This specific example is a data point within the instant claim range. Furthermore the range of Yamihira 2.0-4.3 g/ml encompasses the range of 2.90-3.35 g/cm^3. In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a

prima facie case of obviousness exists. In re Wertheim, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); In re Woodruff, 919, F.2d 1575, 16 USPQ 2d 1934 (Fed. Cir. 1990).

The motivation for providing a density within a range of 2.5 to 4.0 g/ml such as 3.1 g/ml is to optimize the energy density of the electrode, the electrolyte solution impregnation characteristics of the electrode and the charging and discharging characteristics of the electrode and cell.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Toyoguchi by providing a packing density in the range of 2.90-3.35 g/cm^3 since it would have optimized the energy density of the electrode, the electrolyte solution impregnation characteristics of the electrode and the charging and discharging characteristics of the electrode and cell. Generally, differences in ranges will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such ranges is critical. In re Boesche , 617 F.2d 272, 205 USPQ 215 (CCPA 1980). In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). In re Hoeschele, 406 F.2d 1403, 160 USPQ 809 (CCPA 1969).

5. Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Toyoguchi in view of U.S. patent No. 5,702,843 (Mitate).

The teachings of claims 1 and 7, with respect to Toyoguchi, have been discussed above and are incorporated herein.

The differences between claims 8 and 9 and Toyoguchi are that Toyoguchi does not disclose of a current collector provided to support the cathode mixture (claim 8) or the current collector being aluminum or stainless steel (claim 9).

With respect to claim 8:

Toyoguchi discloses of the positive electrode material is a mixture of the active material, an electrically conductive material (acetylene black) and a binder resin (paragraph bridging columns 2 and 3).

A current collector may be used to facilitate the transfer of electrons to/from the electrode. A material for the collector is not particularly limited, but the collector may be formed of a mono-element metal, an alloy, a carbon material or the like. Examples of specific materials for the collector include titanium, iron, nickel, copper, aluminum, stainless steel, and copper, aluminum and stainless steel materials coated with carbon, nickel, titanium, silver or the like, and those materials surface-treated for oxidation (Mitate, col. 4, ll. 45-59).

The motivation for providing a current collector is that it facilitates electron transfer to and from the electrode.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Toyoguchi by providing a current collector since it would have facilitated electron transfer to and from the electrode.

With respect to claim 9:

A material for the collector is not particularly limited, but the collector may be formed of a mono-element metal, an alloy, a carbon material or the like. Examples of specific materials for the collector include titanium, iron, nickel, copper, aluminum, stainless steel, and copper, aluminum and stainless steel materials coated with carbon, nickel, titanium, silver or the like, and those materials surface-treated for oxidation (Mitate, col. 4, ll. 45-59). The selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in Sinclair & Carroll Co. v. Interchemical Corp., 325 U.S. 327, 65 USPQ 297 (1945) See also In re Leshin, 227 F.2d 197, 125 USPQ 416 (CCPA 1960). MPEP § 2144.07.

The motivation for selecting the current collector to be stainless steel or aluminum that it would have provided a cathode support which has good electrical conductivity but does not undergo chemical change in the battery.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Toyoguchi by selecting the current collector to be stainless steel or aluminum since it would have provided a cathode support which has good electrical conductivity but does not undergo chemical change in the battery.

(11) Response to Argument

Issue (A) - 1 - Appellant argues that JP '316 (referred to by Appellant as Aoki) does not exemplify any lithium cobalt composite oxides within the terms of the present claims.

The Examiner is not persuaded by this argument in light of the teachings of the prior art of JP '316.

As set forth in the prior art rejection of JP '316 above, JP '316 teaches of a range of x between 0 and 0.25 (paragraph [0009]) and provides working examples in paragraph [0013] which show x values within a range of 0 and 0.02. Thus contrary to Appellants argument, the prior art of JP '316 is in fact held to exemplify lithium cobalt oxides within the terms of the present claims.

Issue (A) - 2 - Appellant argues that JP '316 (referred to by Appellant as Aoki) does not recognize the effect the value of "x" has on both the half-width and capacity retention.

The Examiner is not persuaded by this argument in light of the teachings of the prior art of JP '316.

As set forth in the prior art rejection of JP '316 above, JP '316 teaches of a range of x between 0 and 0.25 (paragraph [0009]) and provides working examples in paragraph [0013] which show x values within a range of 0 and 0.02. Thus contrary to Appellants argument, the prior art of JP '316 is in fact held to exemplify lithium cobalt oxides within the terms of the present claims.

Given the fact that the prior art teaches of working examples within the range of the instant claims, there is a valid reasonable expectation that the prior art product will inherently have the same characteristics as the product of the instant claims, absent clear evidence to the contrary.

Appellant states that they have demonstrated with the date of record that it is not reasonable to presume that JP '316 meets, or otherwise suggests, the presently claimed invention. This statement is not persuasive for the following reasons.

First, there is no disclosure or evidence in the data of record showing a side-by-side comparison between the instant claims and the prior art products of JP '316. Thus the data of record is deficient in supporting Appellant's position that JP '316 does not reasonably meet or suggest the claimed invention.

Second it would appear from the written description of the instant application that by providing a value of x between 0 and 0.02, the claimed characteristics will be achieved. For example see page 4, line 26 through page 6, line 4 wherein the specification teaches that the properties of lithium cobalt oxides having M added thereto in a range between 0 and 0.02 include those properties recited in the instant claims.

Lastly the specification does not clearly set forth that such properties are only achieved by certain x values or certain methods of making the product. Therefore in light of the full record, and contrary to Appellants position, there is no clear demonstration with the date of record that it is not reasonable to presume or expect that JP '316 meets or suggests the claimed invention and absent such evidence the position of the Examiner stands.

Issue (A) - 3 - Appellant argues that claim 2 is separately patentable because JP '316 (referred to by Appellant as Aoki) does not disclose or suggest x being a value from 0.0005 to 0.02 and having a particular half-width diffraction peak.

The Examiner is not persuaded by this argument in light of the teachings of the prior art of JP '316.

As established in the prior art rejection and iterated in the Examiners response to Issue (A) - 1, JP '316 above, JP '316 teaches of a range of x between 0 and 0.25 (paragraph [0009]) and provides working examples in paragraph [0013] which show x values within a range of 0 and 0.02. In the various working examples in paragraph [0013], it is evident that JP '316 teaches of x values of 0.03, which considering the relatively small range of x is close to 0.02 and further of a specific x value of 0.01 which is well within the range of claim 2. Thus contrary to Appellants argument, the prior art of JP '316 is in fact held to exemplify lithium cobalt oxides within the terms of the present claims.

Thus it is held that JP '316 teaches of at least one working example within the range of the instant claims and of at least one working example which is significantly near the claimed range. The first of which held to be anticipatory of the claimed range and the second being slightly different but very close to the claimed range. The record being devoid of evidence that values of 0.03 do not provide these characteristics.

Given the fact that the prior art teaches of at least one working example, it is reasonable to expect that the working example will inherently have the same characteristics of claim 2 as set forth in the prior art rejection above and further in light of the fact that there is no clear evidence on the record to teach otherwise (see Issue (A) -2 response above drawn to the inherence of the claimed characteristics).

Note further that while Appellant has stated that claim 2 is separately patentable because JP '316 does not disclose the range of x and half-width of the diffraction peak

as recited in claim 2, the Appeal Brief provides no clear reasoning, evidence or argument to this specific argument.

Therefore the prior art rejection stands.

Issue (A) - 4 - Appellant argues that claim 12 is separately patentable because JP '316 (referred to by Appellant as Aoki) does not the process of claim 12.

Claim 12 is held to be a product-by-process claim. Basis for such is found within the first two lines of claim 12 which state "The hexagonal lithium-cobalt composite oxide ... *obtained by a process* ...".

The prior art product of JP '316 is still held to be a valid rejection as set forth above. Since the prior art product is the same as the claimed product, and since there is no clear evidence on the record of the criticality of the process claims in the product-by-process of claim 12, patentabilty has only been accorded to the product.

Note further that while Appellant has stated that claim 12 is separately patentable because JP '316 does not disclose the process of claim 12, the Appeal Brief provides no clear reasoning, evidence or argument to this specific argument.

Therefore the prior art rejection stands.

Issue (A) - 5 - Appellant argues that claim 14 is separately patentable because JP '316 (referred to by Appellant as Aoki) does not the process of claim 12.

Claim 12 is held to be a product-by-process claim. Basis for such is found within the first two lines of claim 14 which state "The hexagonal lithium-cobalt composite oxide ... *obtained by a process* ...".

The prior art product of JP '316 is still held to be a valid rejection as set forth above. Since the prior art product is the same as the claimed product, and since there is no clear evidence on the record of the criticality of the process claims in the product-by-process of claim 14, patentabilty has only been accorded to the product.

Note further that while Appellant has stated that claim 14 is separately patentable because JP '316 does not disclose the process of claim 14, the Appeal Brief provides no clear reasoning, evidence or argument to this specific argument.

Therefore the prior art rejection stands.

Point of clarification regarding Appellant's final statement in Issue (A):

Appellant's statement that the Examiner has found the process recited in claims 12 and 14 to be patentable is not valid.

Claims 12 and 14 are product-by-process claims and such position has been clearly set forth by the Examiner in the prior art rejections of record.

Thus in terms of patentability, the only aspects of the claim given patentable weight are to those features of the final product of claim 1. So while it may be that the process limitations are novel, the Examiner has not made this determination with respect to the process limitations of claims 12 and 14 and has not been required to do such since Appellant has not shown criticality of the process in the product-by-process claims.

Issue (B) - Appellant argues that claim 4 is patentable because the teachings of Yamahira are fundamentally different from the present invention in the method for

producing the positive electrode material and that the combination of JP '316 in view of Yamahira would not have been obvious.

This argument is not persuasive for the following reasons:

First, claim 4 is drawn to a product and not a process of making. Therefore it is the product limitations that have been employed in determining patentability and not the process for making the product.

Second and along with the first reason, the comparison that the argument makes is not germane to the manner in which the prior art rejection is applied. The fact that the processes of the instant invention and Yamahira are allegedly fundamentally different has no immediate or evident bearing on the patentability of the product. Additionally there is no relevance to this argument since the combination used in the rejection is not the instant application in light of Yamahira, but rather to JP '316 in view of Yamahira.

Thirdly, Appellant then states that even if the product of JP '316 were to have the volumetric density of Yamahira, the result would still not be the presently claimed invention, since Yamahira does not remedy the alleged deficiencies of JP '316. This argument is not persuasive since it is held that JP '316 is not deficient in the manner which Appellant alleges (see Issue (A) 1-5 above).

While the processes of JP '316 and Yamahira may not be the same, the teachings of Yamahira with respect to volumetric density are still applicable to the positive electrode regardless of the process. Yamahira teaches that the volumetric density of the positive electrode should be within the desired range set forth therein (see paragraph bridging columns 3 and 4). The benefit of a cathode having such a

volumetric density is that it improves the energy density of the positive electrode and improves the charging and discharging characteristics of the positive electrode.

Whether a cathode is formed via a sintering process or other process it will have an inherent volumetric density. Optimizing the volumetric density as recited in claim 4 is not held to be a significant contribution to the art as evidenced by Yamahira for the reasons set forth above.

Additionally note that while the argument teaches that the processes of the two references are different, it provides no evidence or reasons as to why the combination of the two references would not have been obvious to one of ordinary skill in the art.

Appellant's arguments to the Examiner's failure to the limitation to be a result effective variable is acknowledged, but not persuasive first because the prior art rejection is not applied as optimization of a result effective variable nor has such a variable been shown by Appellant to be unexpected.

Issue (C) - 1 - Appellant argues that claims 1, 2, 7 and 1-14 are patentable because Toyoguchi does not teach or suggest of the x value as recited in these claims.

This argument is not persuasive for the following reasons:

While Toyoguchi claims a range of x greater than 0.02 (see claim 1), the full disclosure of the prior art reference in fact teaches of the claimed range.

As set forth in the rejection of record above, Table 4, second example teaches of a working example wherein x=0.02. This results in a positive electrode material having the following composition:

$LiCo_{(0.98)}Ti_{(0.02)}O_2$

This example falls directly on the upper end limit of the instant claimed invention.

Having taught of the same exact positive electrode composition within the complete disclosure of Toyoguchi, there is a reasonable expectation that this product will have the same inherent characteristics as recited in the instant claims.

Thus contrary to Appellants argument, the prior art of Toyoguchi is in fact held to exemplify lithium cobalt oxides within the terms of the present claims.

Given the fact that the prior art teaches of working examples within the range of the instant claims, there is a valid reasonable expectation that the prior art product will inherently have the same characteristics as the product of the instant claims, absent clear evidence to the contrary.

Appellant states that they have demonstrated with the date of record that it is not reasonable to presume that Toyoguchi meets, or otherwise suggests, the presently claimed invention. This statement is not persuasive for the following reasons.

First, there is no disclosure or evidence in the data of record showing a side-by-side comparison between the instant claims and the prior art products of Toyoguchi. Thus the data of record is deficient in supporting Appellant's position that Toyoguchi does not reasonably meet or suggest the claimed invention.

Second it would appear from the written description of the instant application that by providing a value of x between 0 and 0.02, the claimed characteristics will be achieved. For example see page 4, line 26 through page 6, line 4 wherein the

specification teaches that the properties of lithium cobalt oxides having M added thereto in a range between 0 and 0.02 include those properties recited in the instant claims. Lastly the specification does not clearly set forth that such properties are only achieved by certain x values or certain methods of making the product. Therefore in light of the full record, and contrary to Appellants position, there is no clear demonstration with the date of record that it is not reasonable to presume or expect that Toyoguchi meets or suggests the claimed invention and absent such evidence the position of the Examiner stands.

Issue (C) - 2 - Appellant argues that claim 2 is separately patentable because Toyoguchi does not disclose or suggest x being a value from 0.0005 to 0.02 and having a particular half-width diffraction peak.

The Examiner is not persuaded by this argument in light of the teachings of the prior art of Toyoguchi.

As established in the prior art rejection and iterated in the Examiners response to Issue (C) - 1, while Toyoguchi claims a range of x greater than 0.02 (see claim 1), the full disclosure of the prior art reference in fact teaches of the claimed range.

As set forth in the rejection of record above, Table 4, second example teaches of a working example wherein x=0.02. This results in a positive electrode material having the following composition:

$LiCo_{(0.98)}Ti_{(0.02)}O_2$

This example falls directly on the upper end limit of the instant claimed invention.

Thus contrary to Appellants argument, the prior art of Toyoguchi is in fact held to exemplify lithium cobalt oxides within the terms of the present claims.

Thus it is held that Toyoguchi teaches of at least one working example within the range of the instant claims. The first of which held to be anticipatory of the claimed range and provide a reasonable expectation that the identical products will have the same properties.

Given the fact that the prior art teaches of at least one working example, it is reasonable to expect that the working example will inherently have the same characteristics of claim 2 as set forth in the prior art rejection above and further in light of the fact that there is no clear evidence on the record to teach otherwise (see Issue (A) -2 response above drawn to the inherence of the claimed characteristics).

Note further that while Appellant has stated that claim 2 is separately patentable because Toyoguchi does not disclose the range of x and half-width of the diffraction peak as recited in claim 2, the Appeal Brief provides no clear reasoning, evidence or argument to this specific argument.

Therefore the prior art rejection stands.

Issue (C) - 3 - Appellant argues that claim 12 is separately patentable because Toyoguchi does not the process of claim 12.

Claim 12 is held to be a product-by-process claim. Basis for such is found within the first two lines of claim 12 which state "The hexagonal lithium-cobalt composite oxide ... *obtained by a process* ...".

The prior art product of Toyoguchi is still held to be a valid rejection as set forth above. Since the prior art product is the same as the claimed product, and since there

is no clear evidence on the record of the criticality of the process claims in the product-by-process of claim 12, patentabilty has only been accorded to the product.

Note further that while Appellant has stated that claim 12 is separately patentable because Toyoguchi does not disclose the process of claim 12, the Appeal Brief provides no clear reasoning, evidence or argument to this specific argument.

Therefore the prior art rejection stands.

Issue (C) - 4 - Appellant argues that claim 14 is separately patentable because Toyoguchi does not the process of claim 12.

Claim 12 is held to be a product-by-process claim. Basis for such is found within the first two lines of claim 14 which state "The hexagonal lithium-cobalt composite oxide ... *obtained by a process* ...".

The prior art product of Toyoguchi is still held to be a valid rejection as set forth above. Since the prior art product is the same as the claimed product, and since there is no clear evidence on the record of the criticality of the process claims in the product-by-process of claim 14, patentabilty has only been accorded to the product.

Note further that while Appellant has stated that claim 14 is separately patentable because Toyoguchi does not disclose the process of claim 14, the Appeal Brief provides no clear reasoning, evidence or argument to this specific argument.

Therefore the prior art rejection stands.

Point of clarification regarding Appellant's final statement in Issue (C):

Appellant's statement that the Examiner has found the process recited in claims 12 and 14 to be patentable is not valid.

Claims 12 and 14 are product-by-process claims and such position has been clearly set forth by the Examiner in the prior art rejections of record.

Thus in terms of patentability, the only aspects of the claim given patentable weight are to those features of the final product of claim 1. So while it may be that the process limitations are novel, the Examiner has not made this determination with respect to the process limitations of claims 12 and 14 and has not been required to do such since Appellant has not shown criticality of the process in the product-by-process claims.

Issue (D) - Appellant argues that claim 4 is patentable because the teachings of Yamahira are fundamentally different from the present invention in the method for producing the positive electrode material and that the combination of Toyoguchi in view of Yamahira would not have been obvious.

This argument is not persuasive for the following reasons:

First, claim 4 is drawn to a product and not a process of making. Therefore it is the product limitations that have been employed in determining patentability and not the process for making the product.

Second and along with the first reason, the comparison that the argument makes is not germane to the manner in which the prior art rejection is applied. The fact that the processes of the instant invention and Yamahira are allegedly fundamentally different has no immediate or evident bearing on the patentability of the product. Additionally

there is no relevance to this argument since the combination used in the rejection is not the instant application in light of Yamahira, but rather to Toyoguchi in view of Yamahira.

Thirdly, Appellant then states that even if the product of Toyoguchi were to have the volumetric density of Yamahira, the result would still not be the presently claimed invention, since Yamahira does not remedy the alleged deficiencies of Toyoguchi 16. This argument is not persuasive since it is held that Toyoguchi is not deficient in the manner which Appellant alleges (see Issue (A) 1-5 above).

While the processes of Toyoguchi and Yamahira may not be the same, the teachings of Yamahira with respect to volumetric density are still applicable to the positive electrode regardless of the process. Yamahira teaches that the volumetric density of the positive electrode should be within the desired range set forth therein (see paragraph bridging columns 3 and 4). The benefit of a cathode having such a volumetric density is that it improves the energy density of the positive electrode and improves the charging and discharging characteristics of the positive electrode.

Whether a cathode is formed via a sintering process or other process it will have an inherent volumetric density. Optimizing the volumetric density as recited in claim 4 is not held to be a significant contribution to the art as evidenced by Yamahira for the reasons set forth above.

Additionally note that while the argument teaches that the processes of the two references are different, it provides no evidence or reasons as to why the combination of the two references would not have been obvious to one of ordinary skill in the art.

Appellant's arguments to the Examiner's failure to the limitation to be a result effective variable is acknowledged, but not persuasive first because the prior art rejection is not applied as optimization of a result effective variable nor has such a variable been shown by Appellant to be unexpected.

Issue (E) - Appellant argues that the rejection of Toyoguchi in view of Mitate should be withdrawn since it does not remedy the alleged basic deficiencies of Toyoguchi.

The Examiner has set forth above and maintains herein that that teachings of Toyoguchi are not deficient with respect to the value of x, the claimed product and the characteristics of the product as claimed. Since Toyoguchi is still held to teach the claimed invention, there is no reason for withdrawing the rejection identified in Appellants Issue (E).

Therefore the rejection stands.

Issue (F) - Appellant argues that the obviousness-type double patenting rejection should be withdrawn since the scope of the claims of each application is different.

The Examiner is not persuaded by this argument.

The claims of the copending application teach of a lithium cobalt composite oxide having a range which encompasses the instant applications claimed range. Thus for the overlapping portion of the range, the product of the copending claims and those of

the instant claims lay forth an identical product and there is a reasonable expectation that the product will have the same characteristics as recited in the instant claims.

The fact that the scope of the claims are different as argued by Appellant prohibits rejection of the claims under statutory double patenting but does not preclude application of obviousness-type double patenting rejections as is the case herein.

There is no additional evidence or data provided by Appellant that the prior art claims are not obvious over the instant claims.

Therefore the obviousness type double patenting rejection stands.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Gregg Cantelmo
Patent Examiner
Art Unit 1745

November 24, 2003

Conferees

Patrick J. Ryan
Supervisory Patent Examiner
Art Unit 1745

Steven P. Griffin
Supervisory Patent Examiner
Art Unit 1731

OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C.
1940 DUKE STREET
ALEXANDRIA, VA 22314